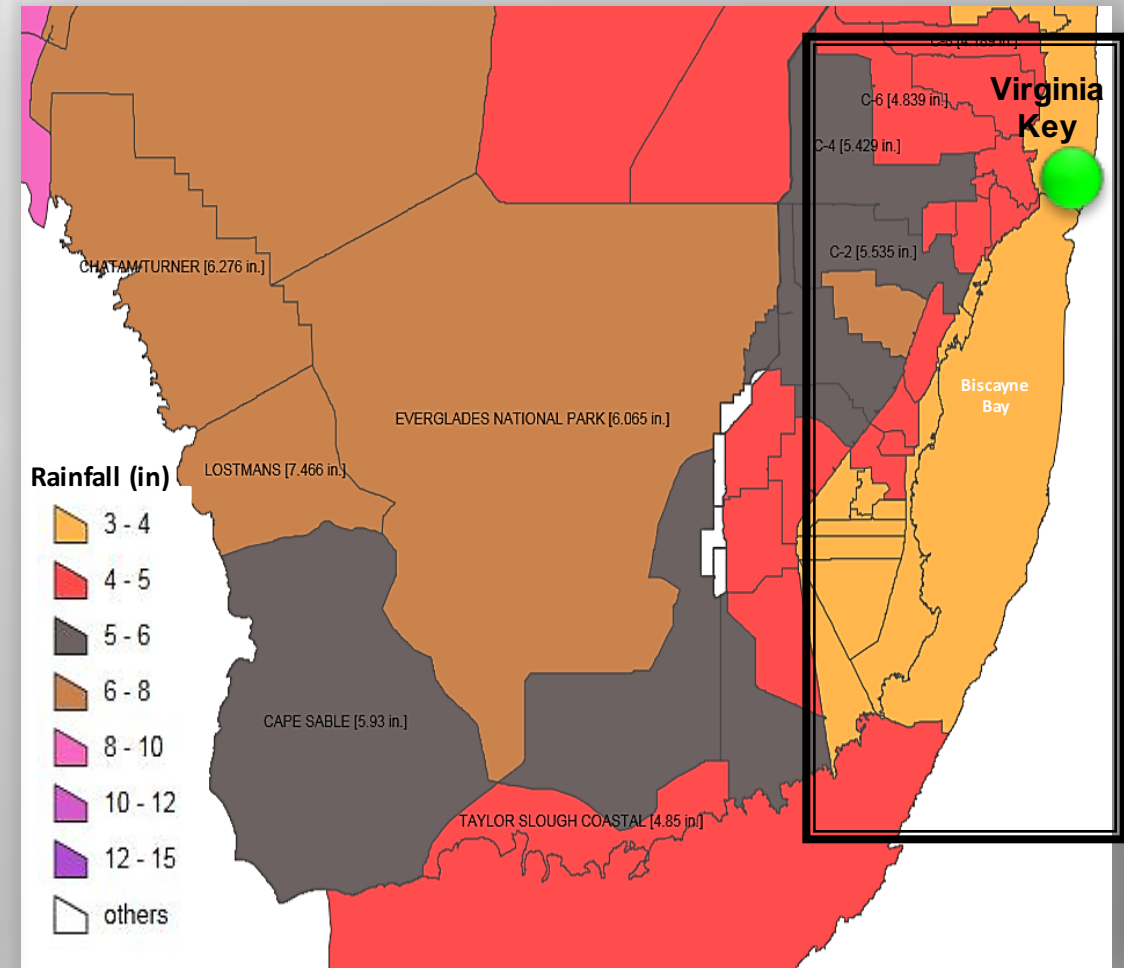


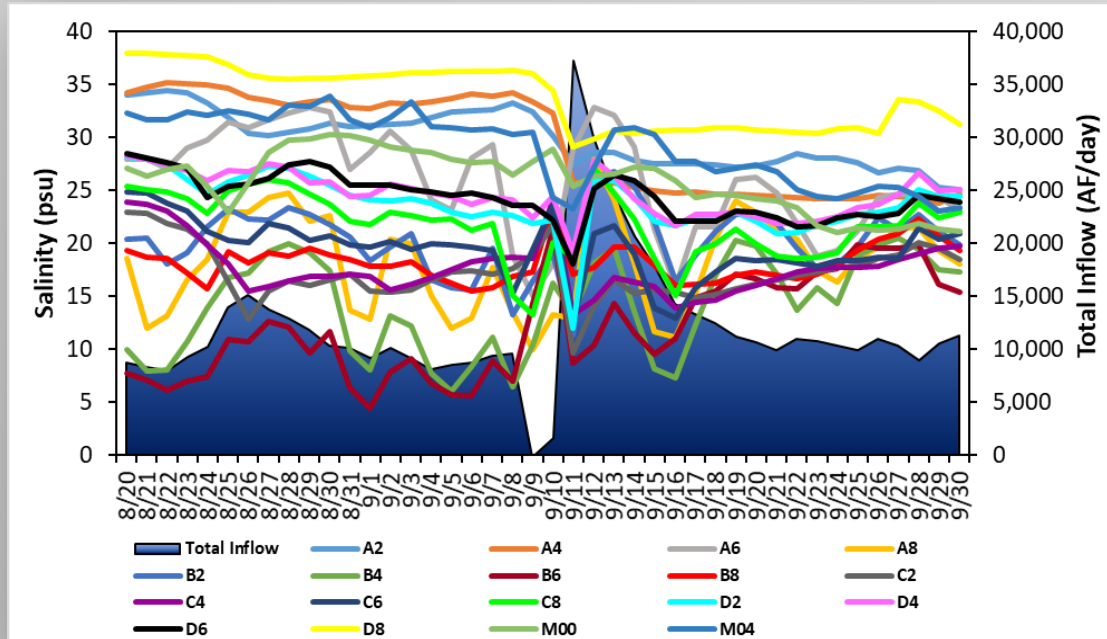
Wind, Precipitation & Temperature Patterns



Rainfall across South Florida on Sept. 10, 2017 (Source: NEXRAD) & the location of the NOAA's wind & temp. station in Virginia Key

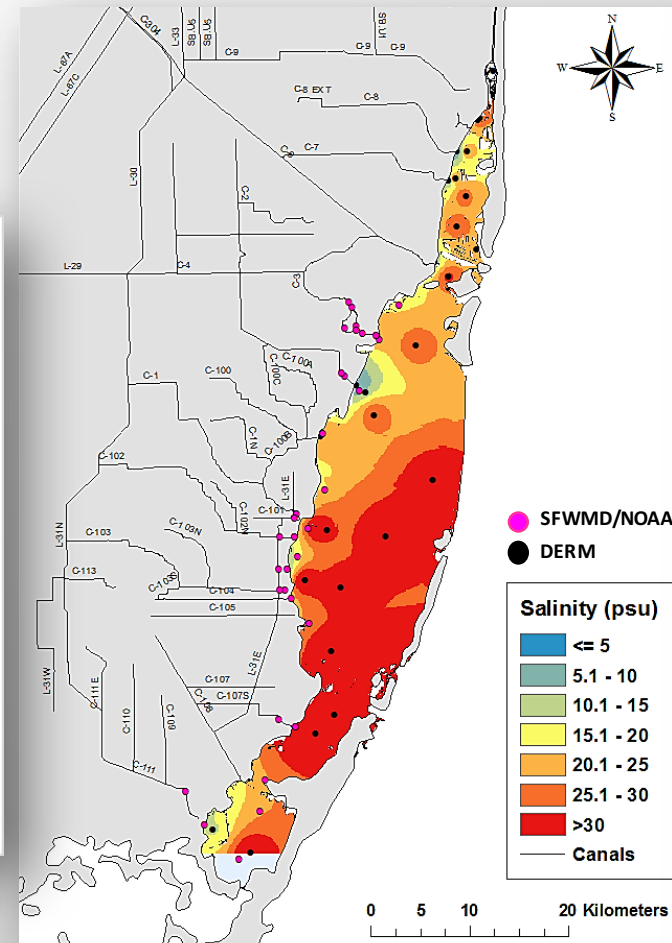
Hurricane-Related Spatial & Temporal Changes in Salinity

- Salinity near shore dropped during the peak of freshwater inflows
- Water column became strongly stratified as a result of freshwater inflows & rainfall

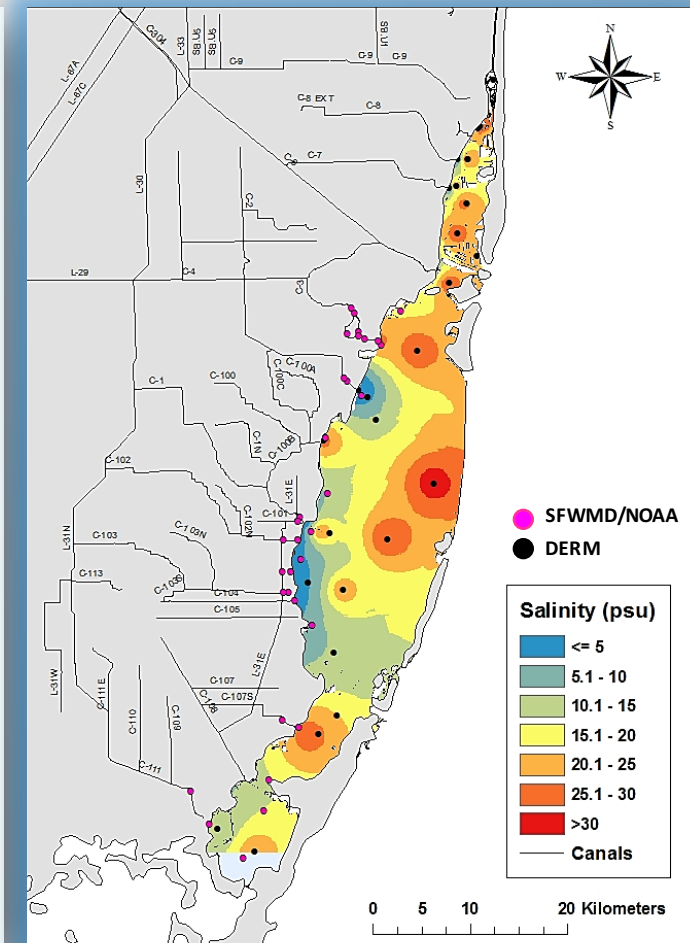


Changes in bottom salinity at near shore locations and freshwater discharges from the canals (Source: SFWMD/NPS)

August 2017
(3 weeks before Hurricane Irma)



September 2017
(2 weeks after Hurricane Irma)

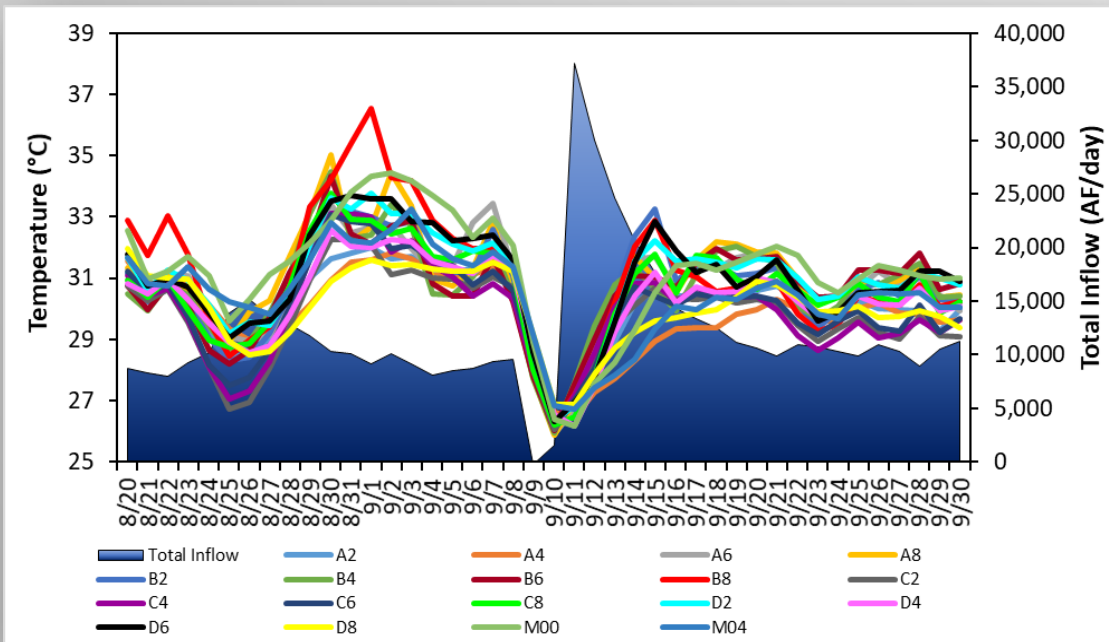


Hurricane-Related Spatial & Temporal Changes in Water Temperature

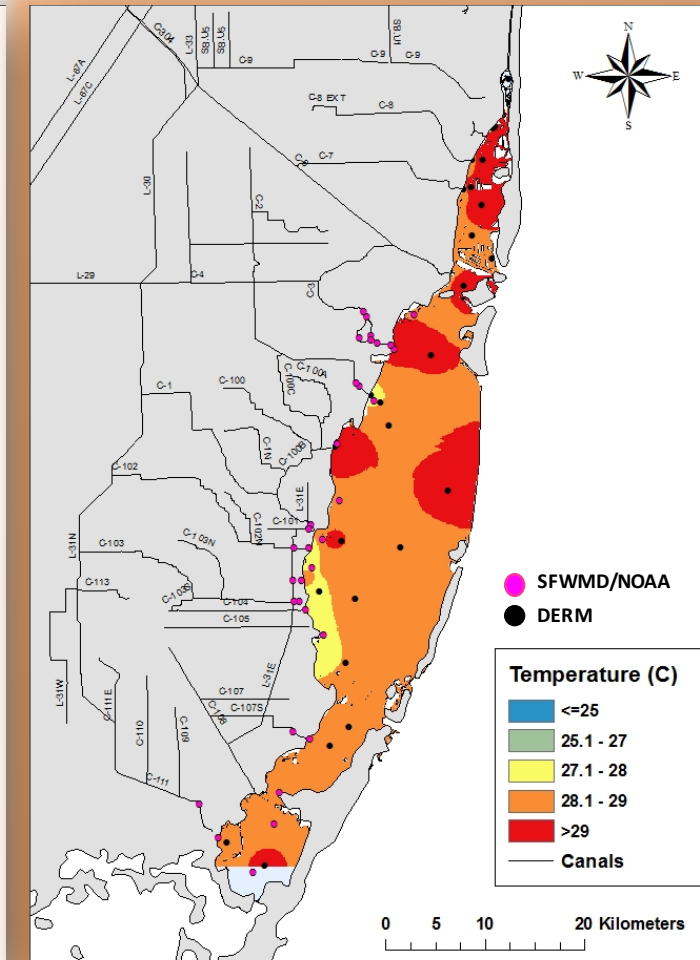
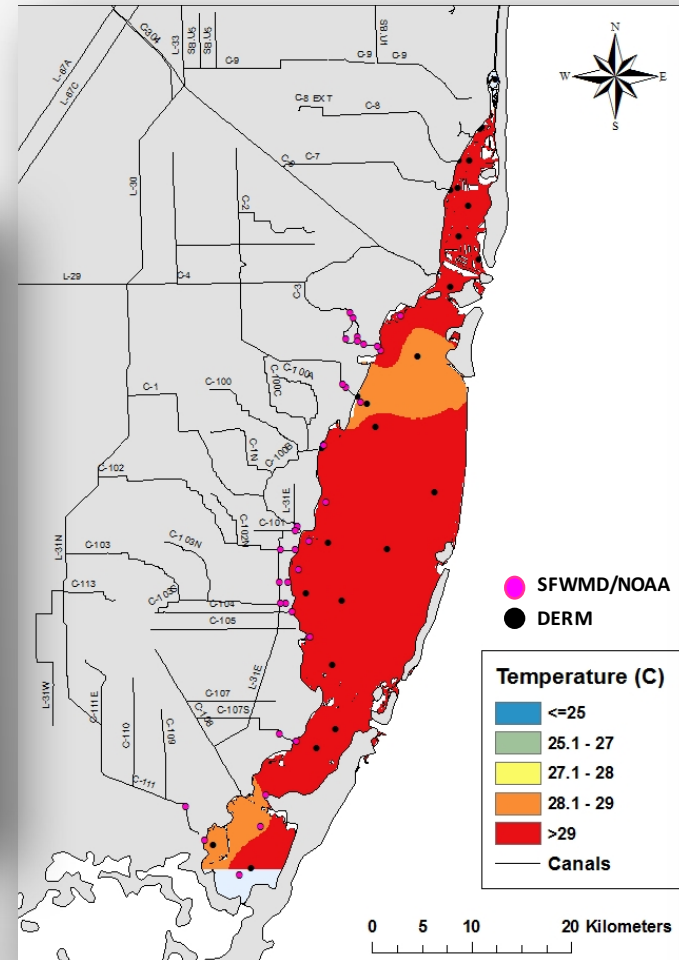
August 2017
(3 weeks before Hurricane Irma)

September 2017
(2 weeks after Hurricane Irma)

- Water temperature dropped by up to 6-7 °C near shore during the peak of freshwater inflows

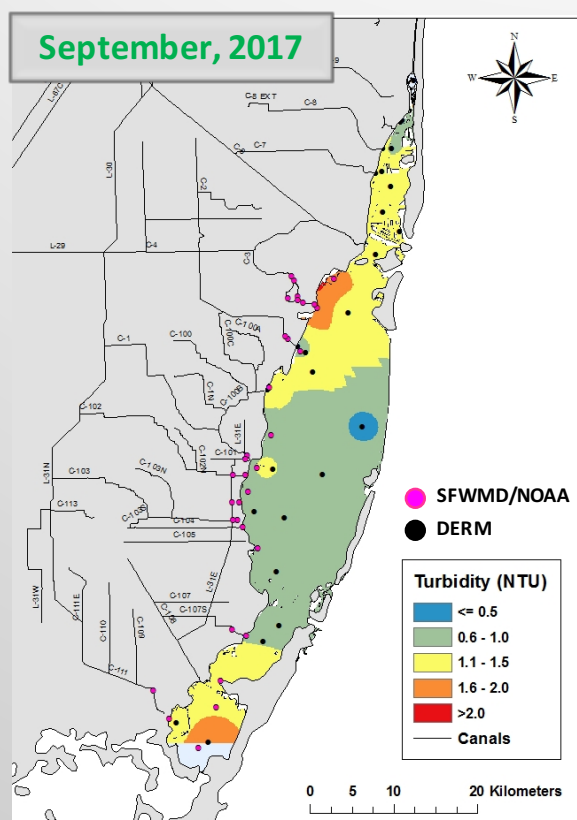
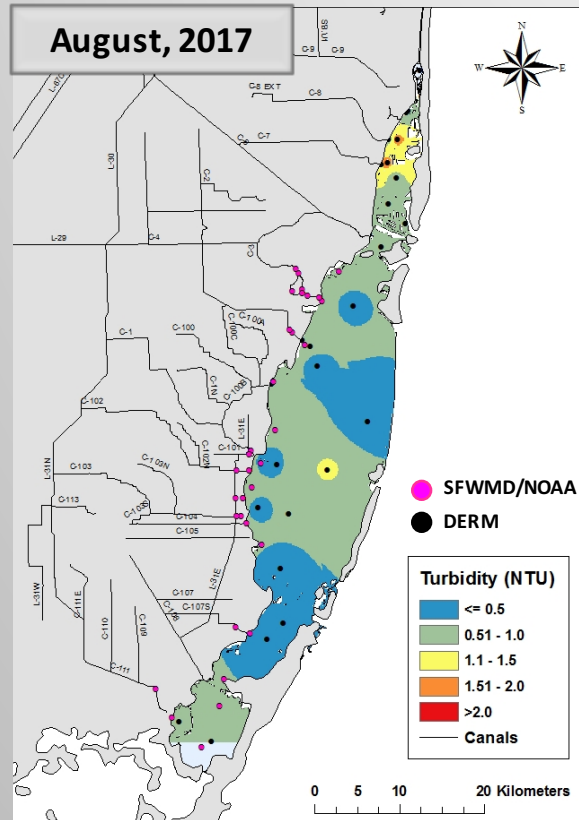


Changes in bottom water temperature at near shore locations and freshwater discharges from the canals (Source: SFWMD/NPS)

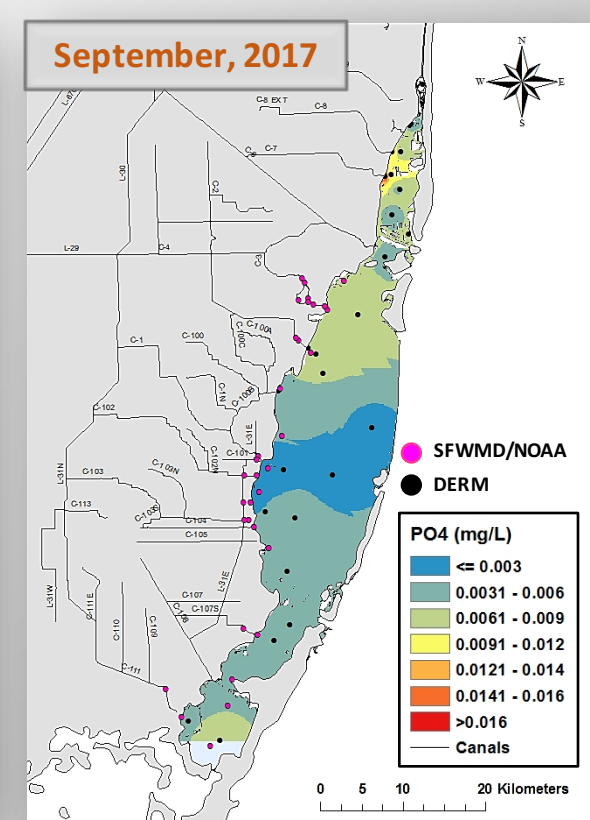
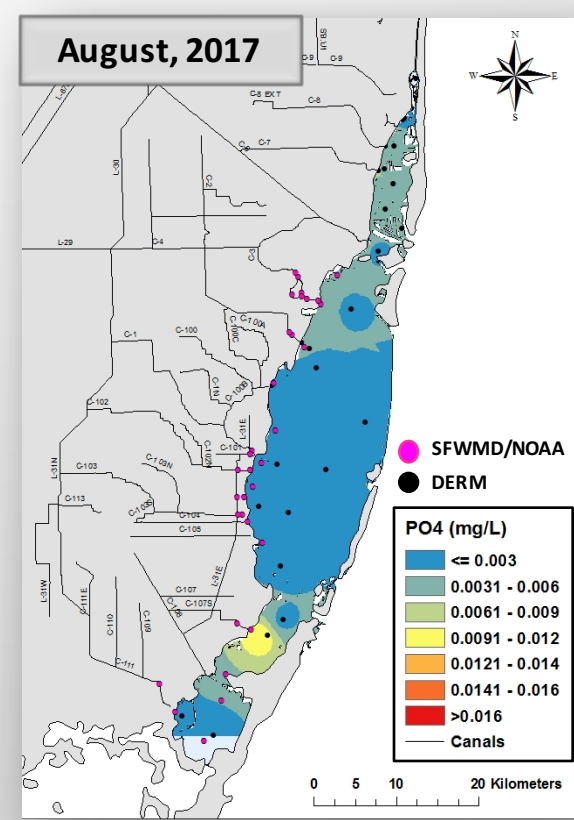


Hurricane-Related Spatial & Temporal Changes in Turbidity & Ortho-Phosphate Concentration

Turbidity



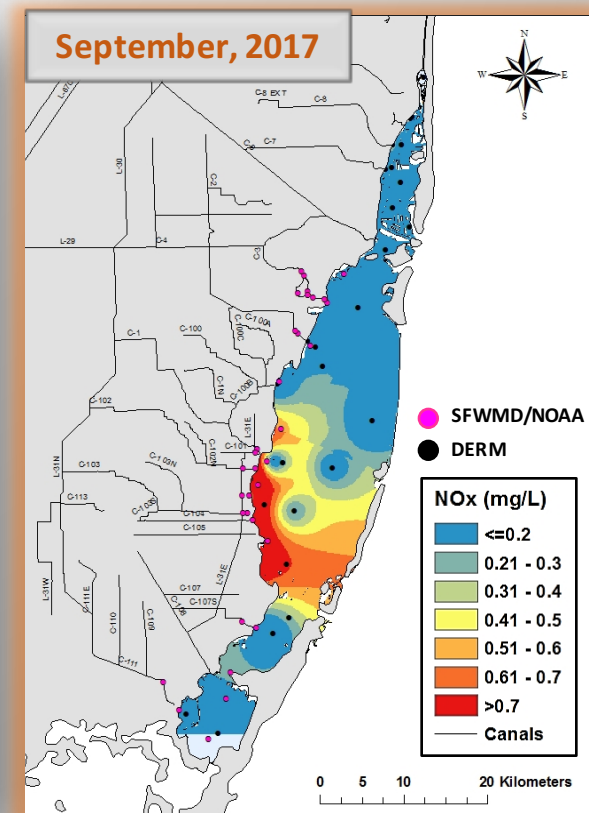
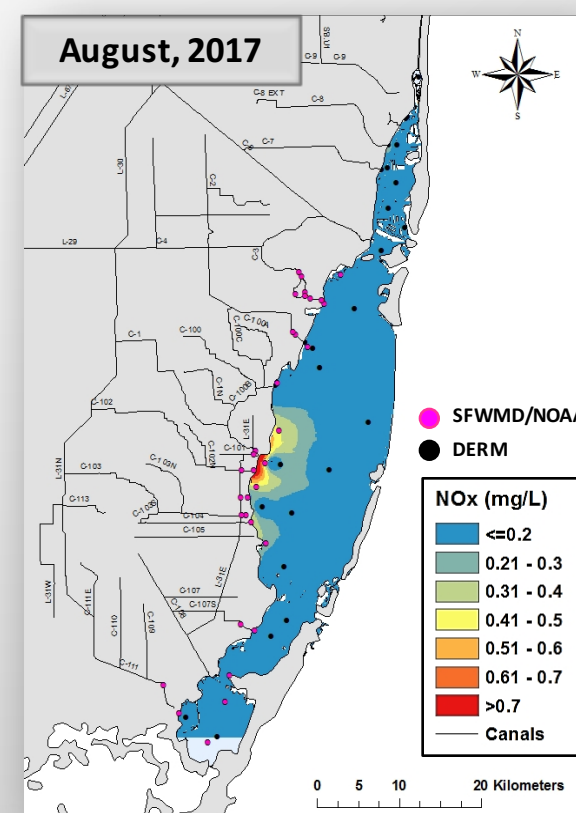
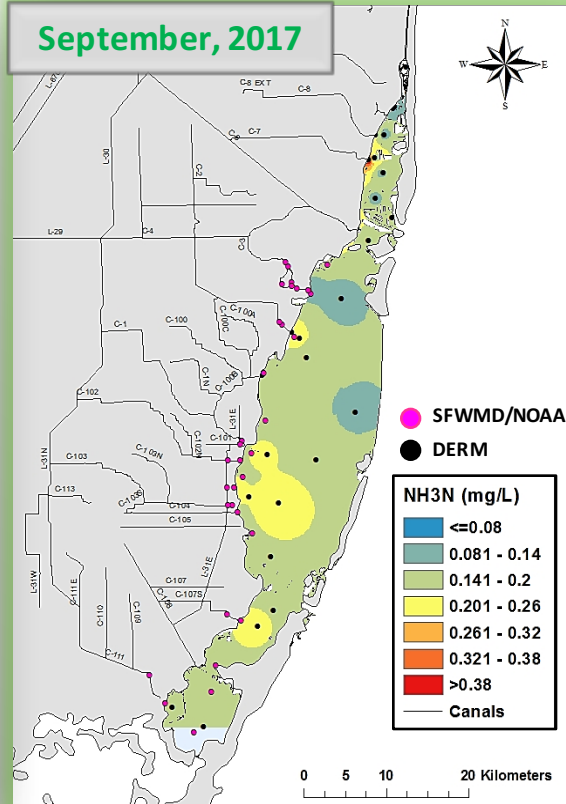
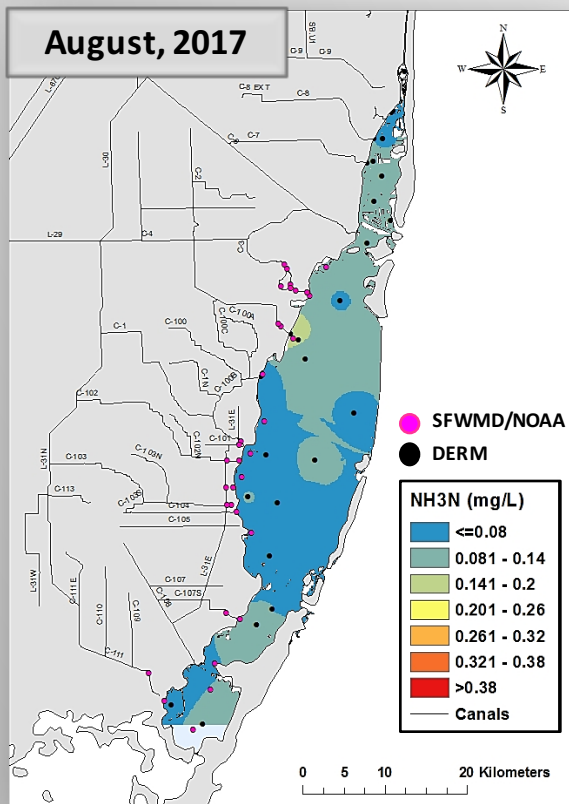
Ortho-Phosphate



Hurricane-Related Spatial & Temporal Changes in Nitrogen Concentration

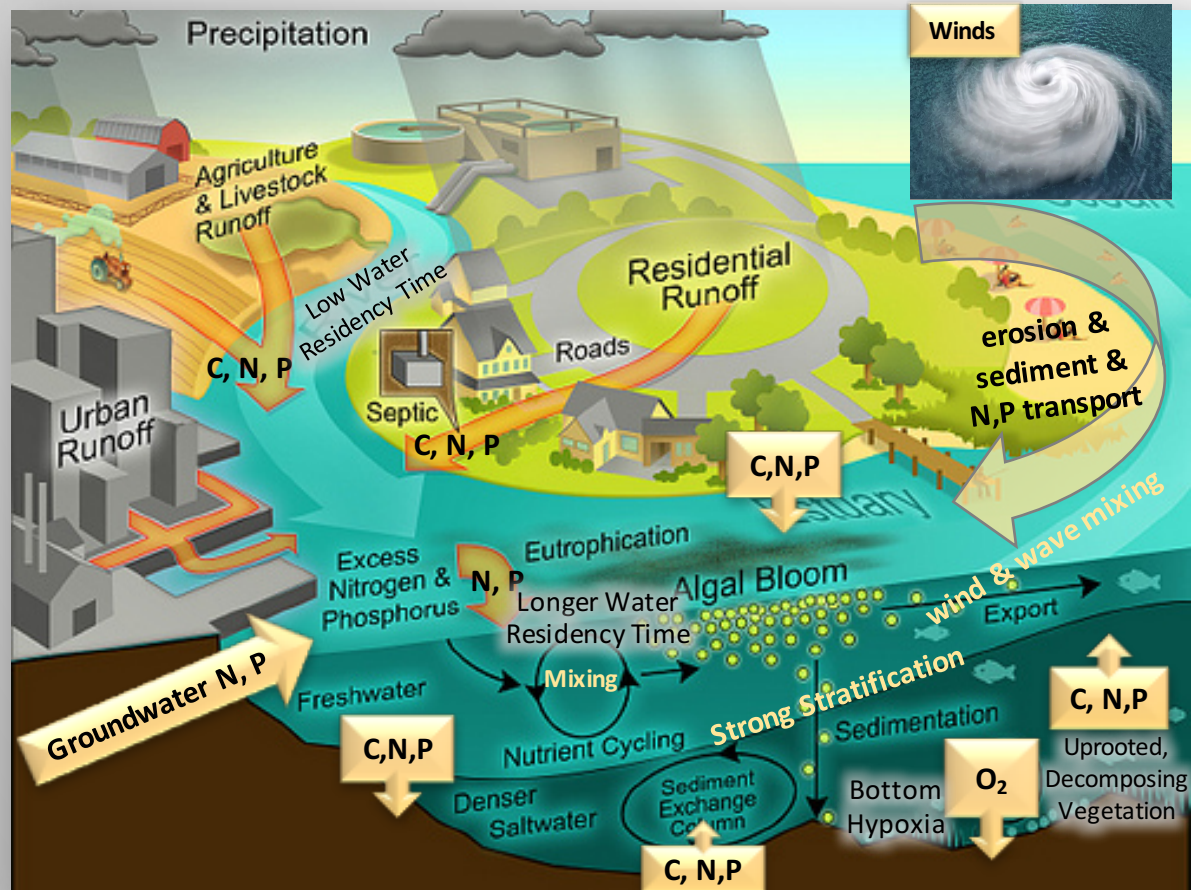
Ammonia

Nitrate & Nitrite



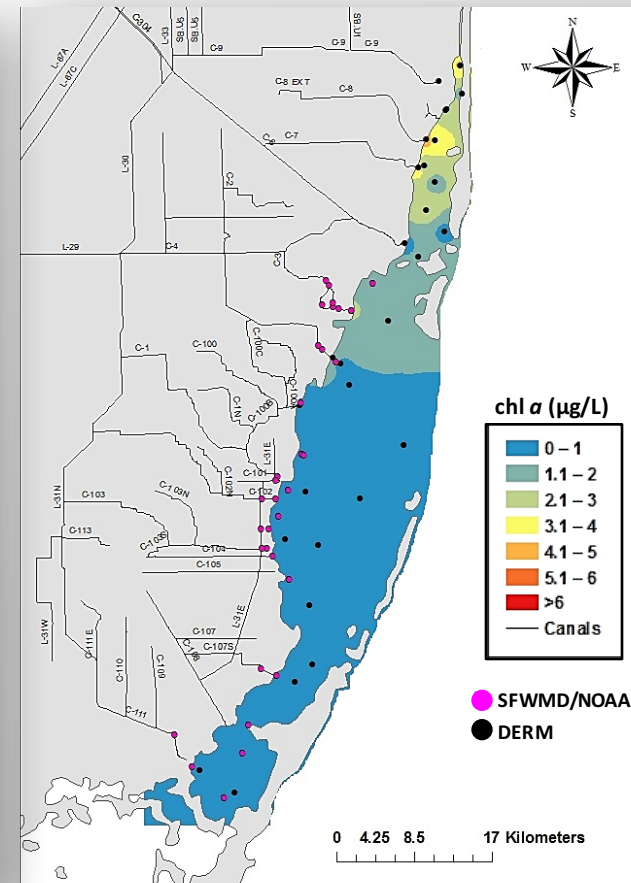
Post-Hurricane Eutrophication of the Bay

Functional Linkages Between Hydrology, Nutrient Inputs & Phytoplankton Blooms After the Hurricane

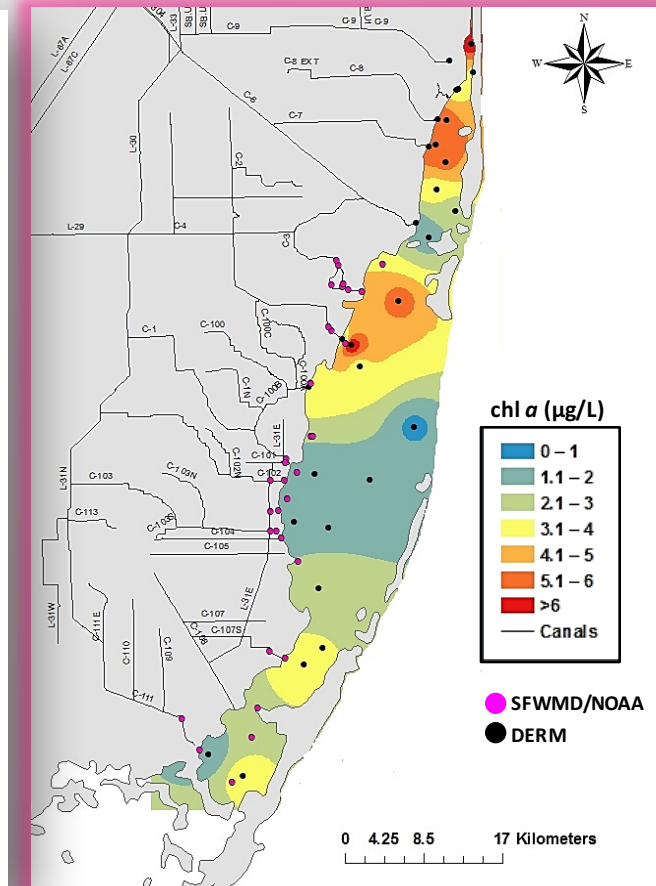


Modified from Pearl (2006)

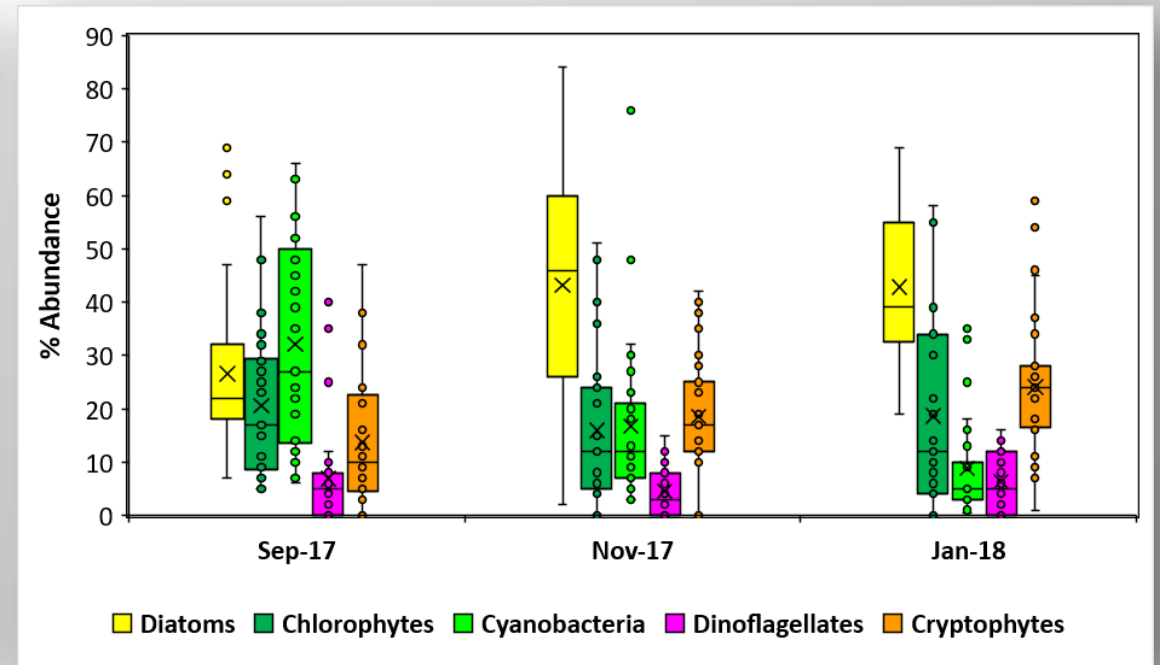
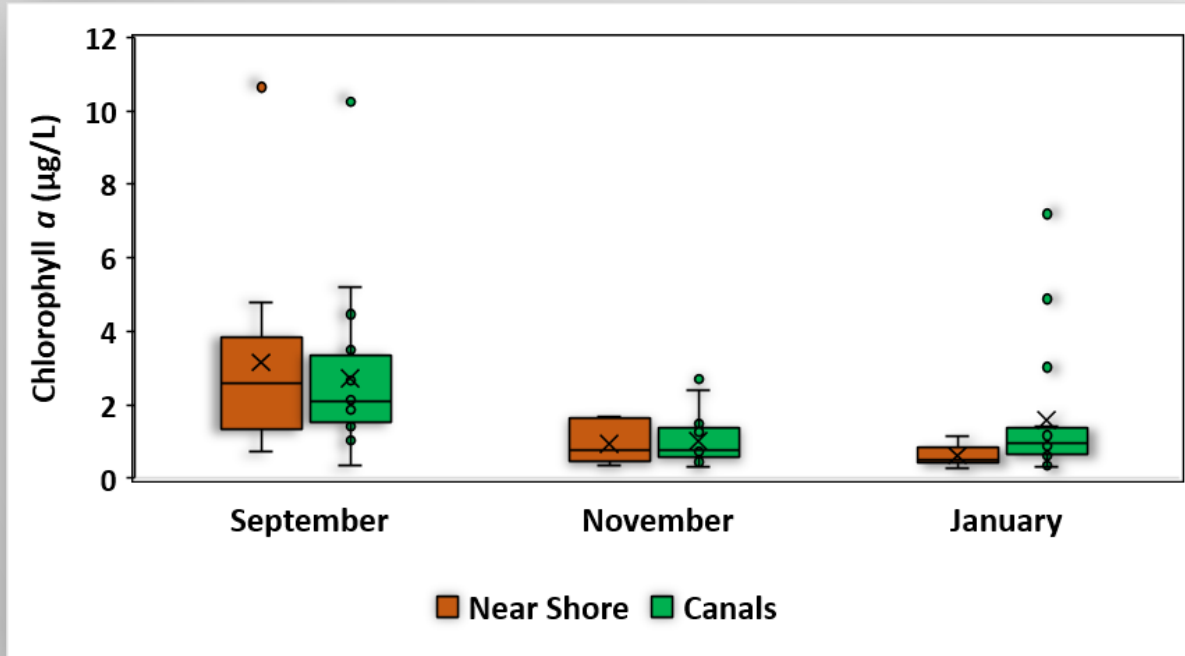
August 2017 (3 weeks before Hurricane Irma)



September 2017 (2 weeks after Hurricane Irma)



Spatial & Temporal Changes in Algal Dynamics Near Shore



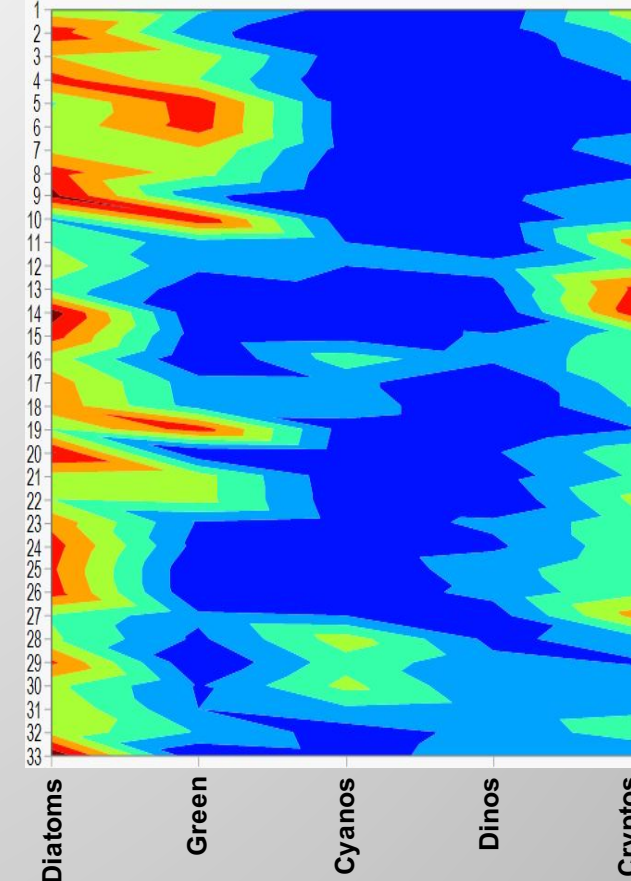
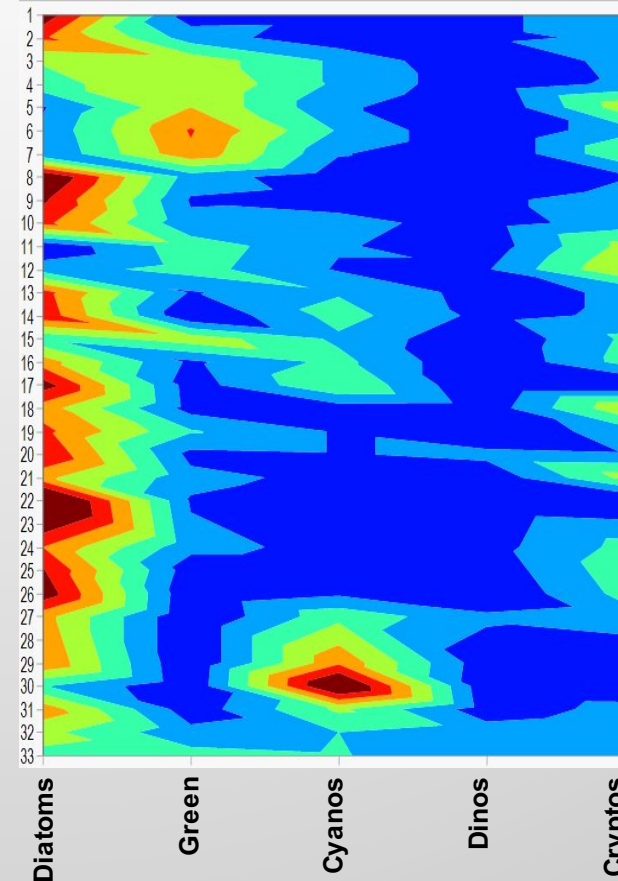
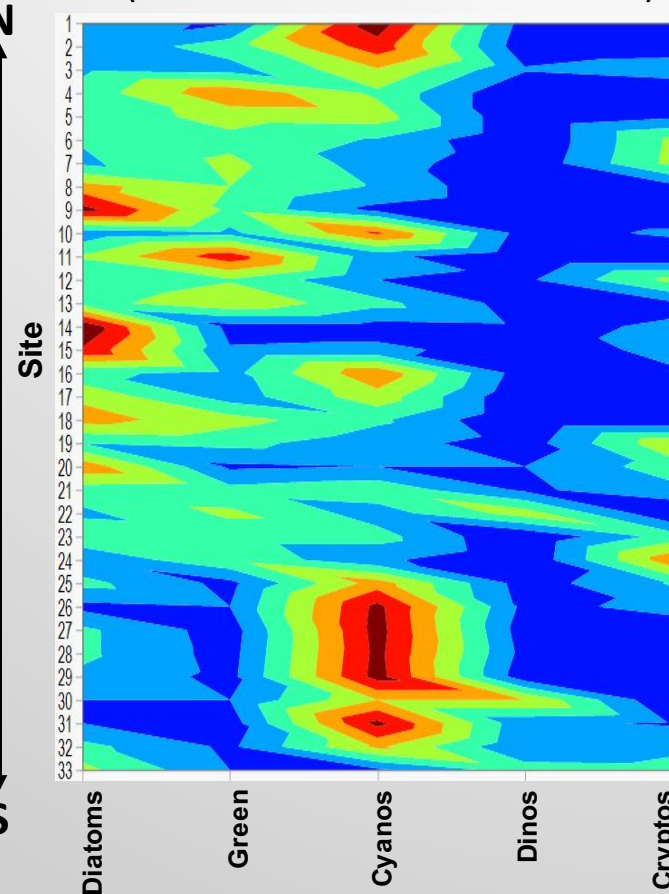
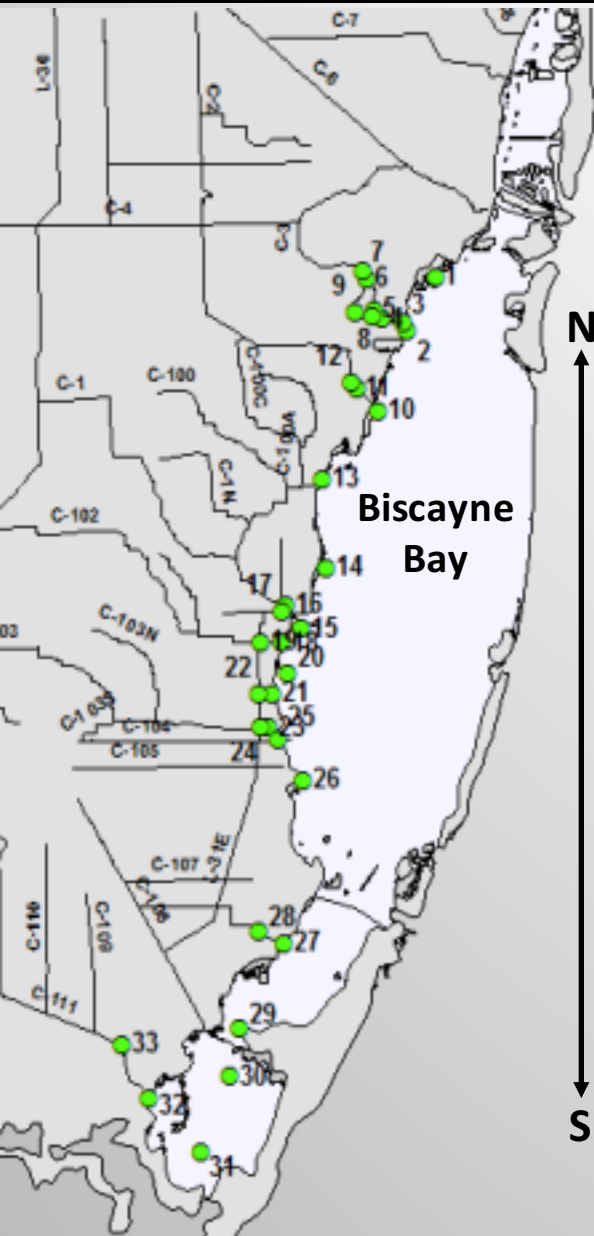
- Algal biomass was significantly higher in September compared to November & January
- Cyanobacteria were most abundant in September, but they were outcompeted by diatoms & green algae (in the canals) in the following months

Changes in Relative Abundance of Phytoplankton Classes in Canals & Near Shore

September 2017
(2 weeks after Hurricane Irma)

November 2017
(9 weeks after Hurricane Irma)

January 2018
(18 weeks after Hurricane Irma)

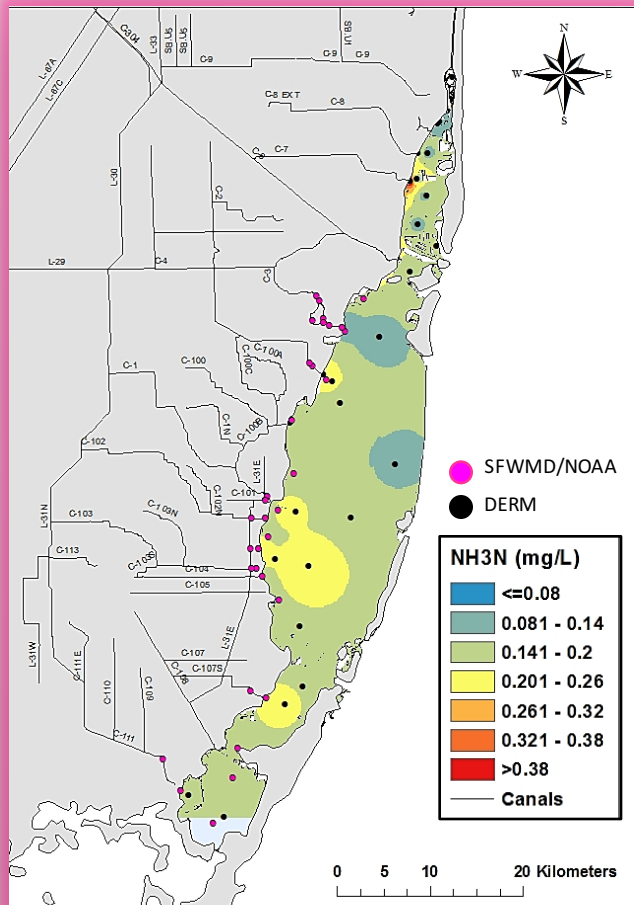


Relative Abundance

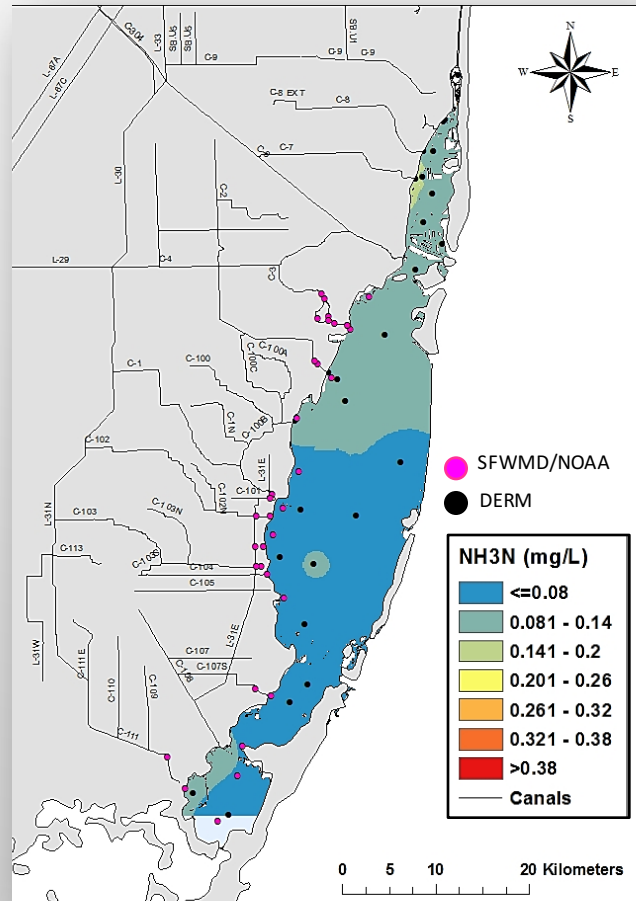


Changes in Ammonia Concentration

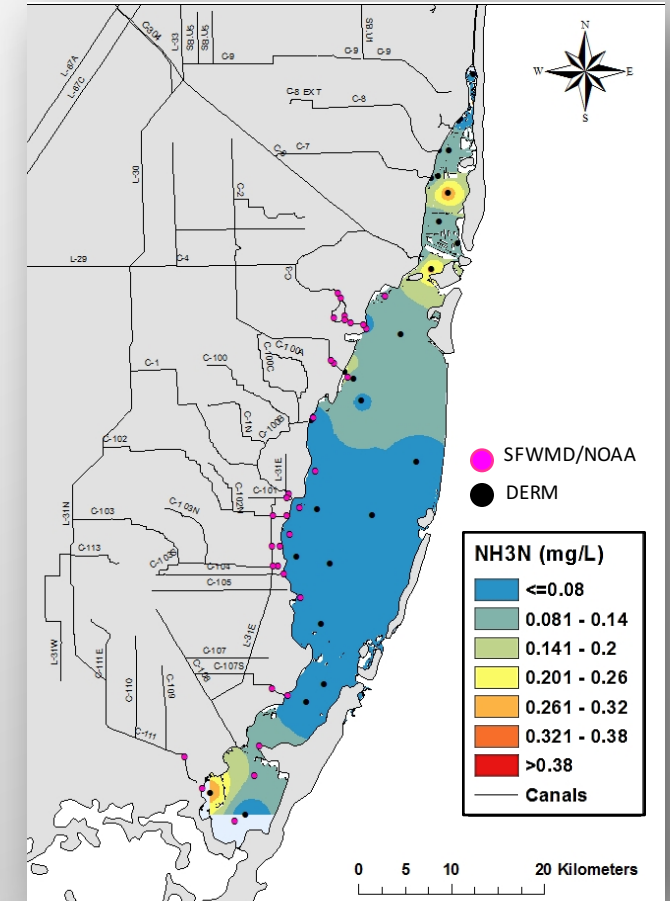
September 2017
(2 weeks after Hurricane Irma)



November 2017
(9 weeks after Hurricane Irma)

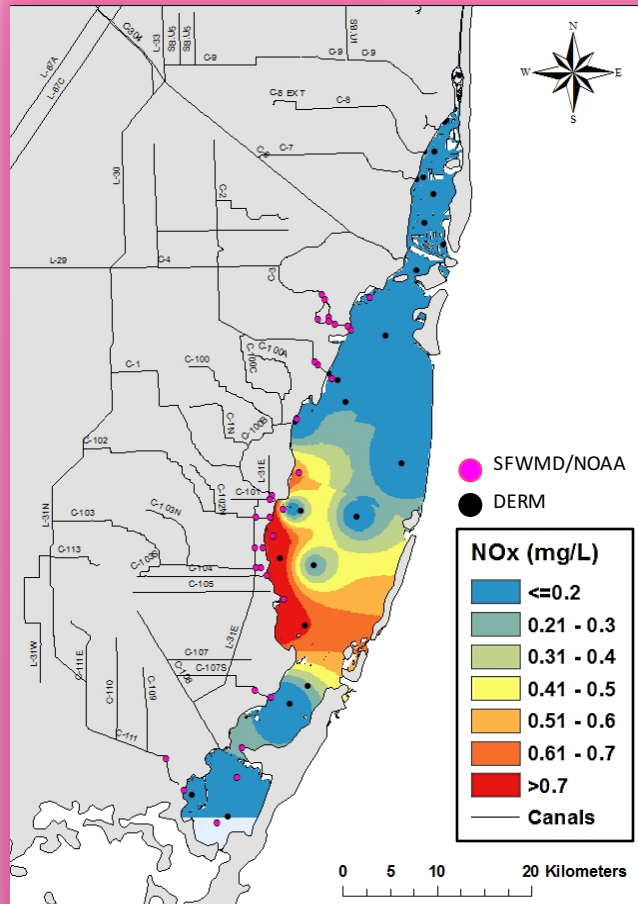


January 2018
(18 weeks after Hurricane Irma)

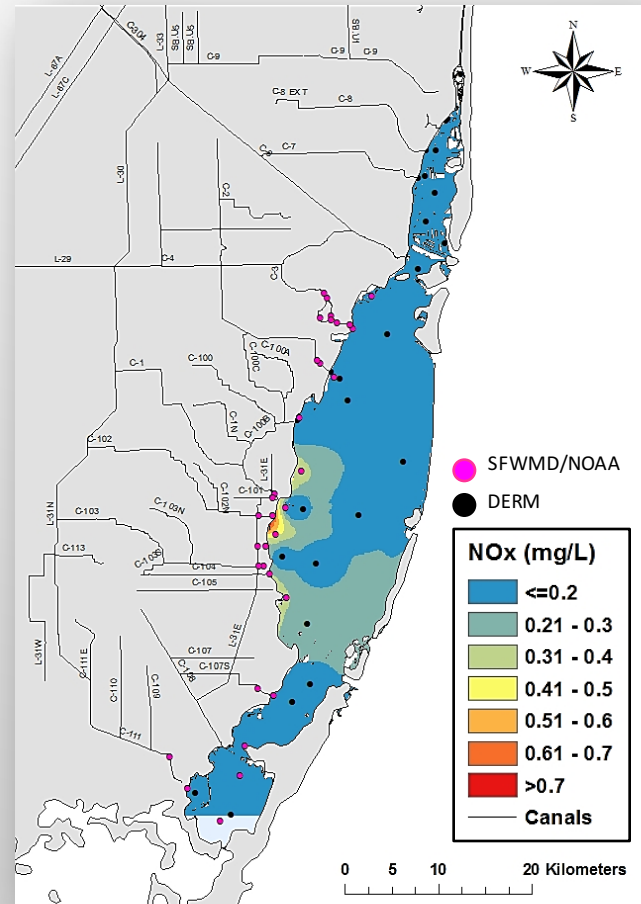


Changes in Nitrate & Nitrite Concentration

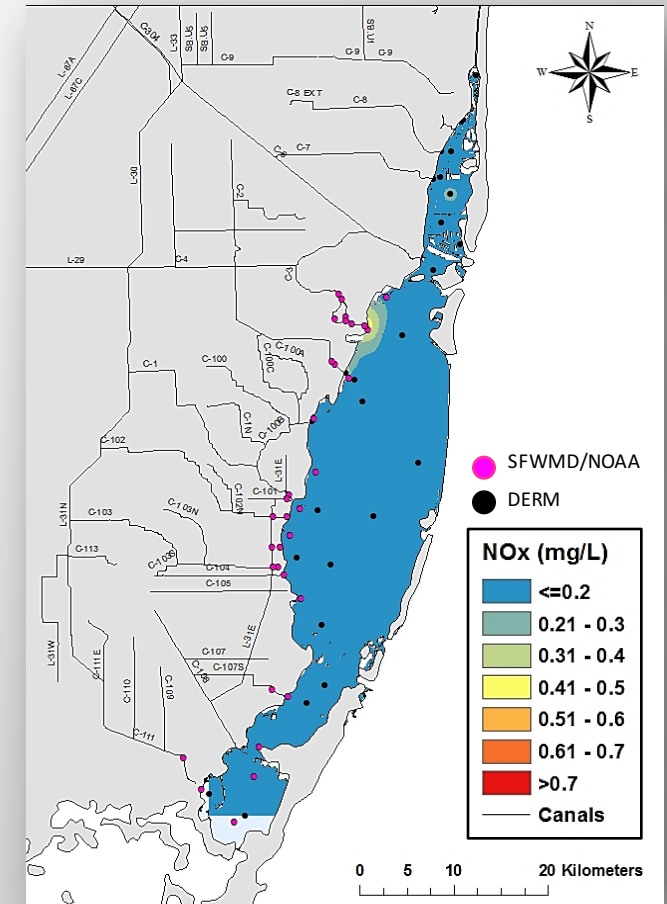
September 2017
(2 weeks after Hurricane Irma)



November 2017
(9 weeks after Hurricane Irma)

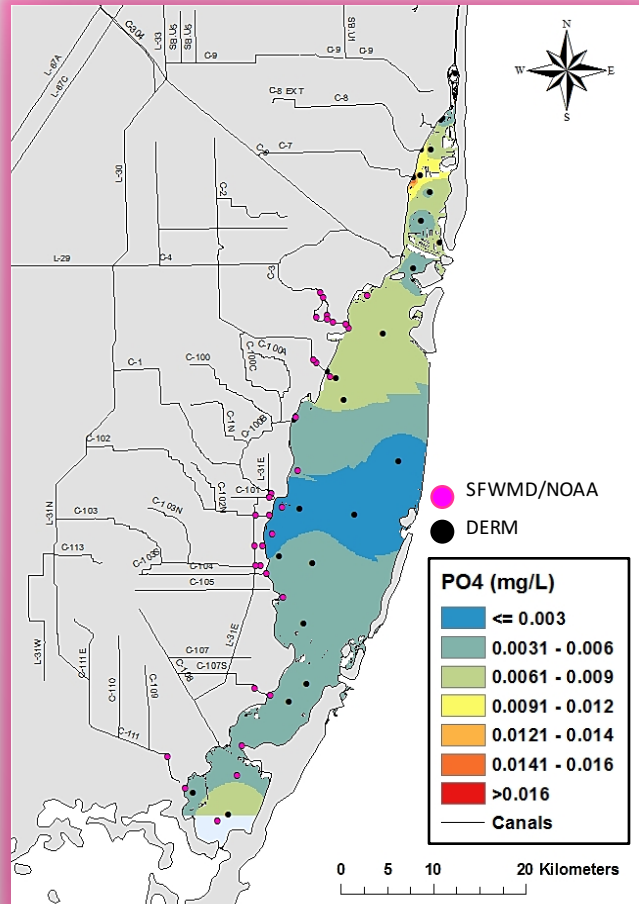


January 2018
(18 weeks after Hurricane Irma)

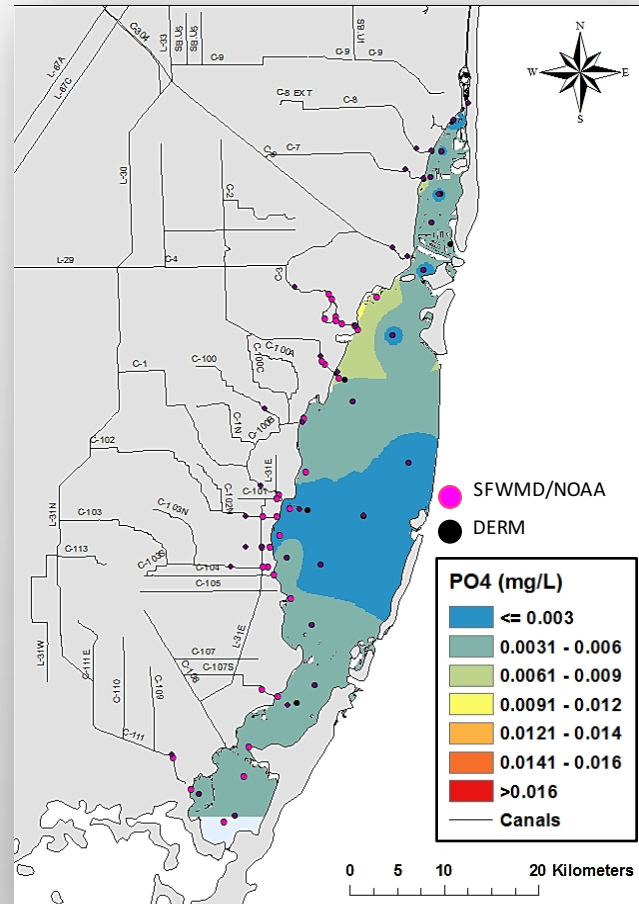


Changes in Ortho-Phosphate Concentration

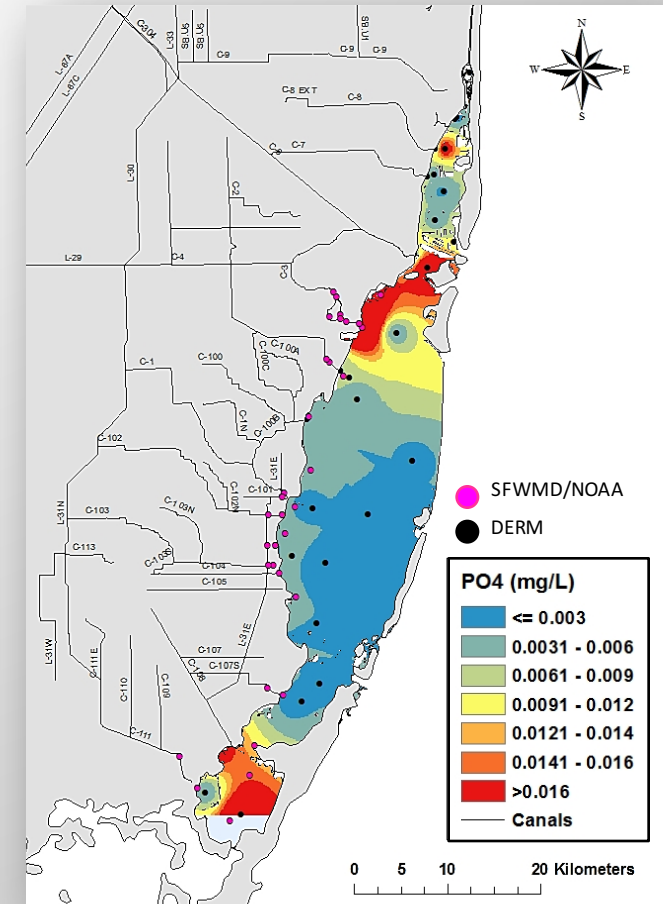
September 2017
(2 weeks after Hurricane Irma)



November 2017
(9 weeks after Hurricane Irma)

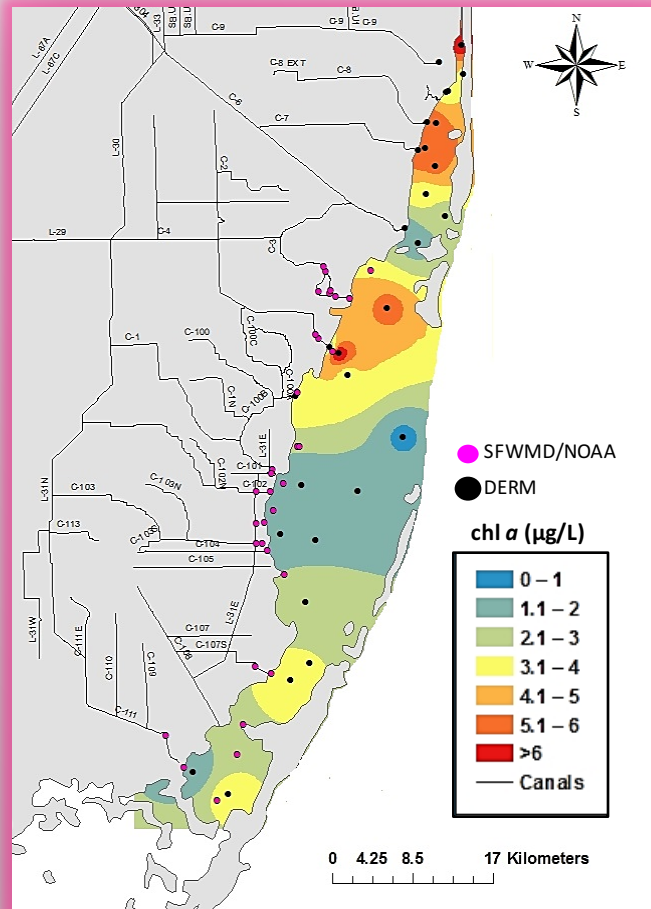


January 2018
(18 weeks after Hurricane Irma)

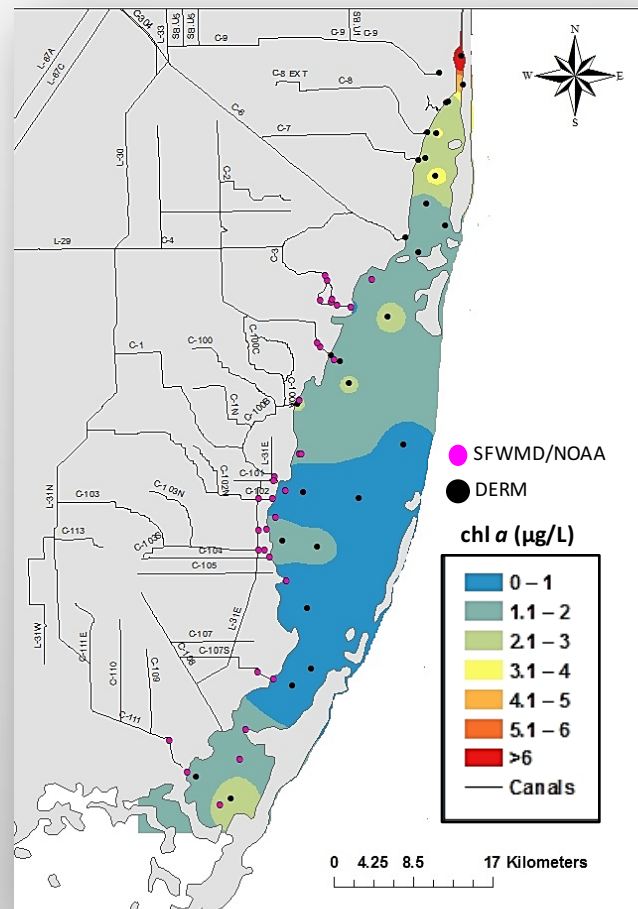


Changes in Algal Biomass

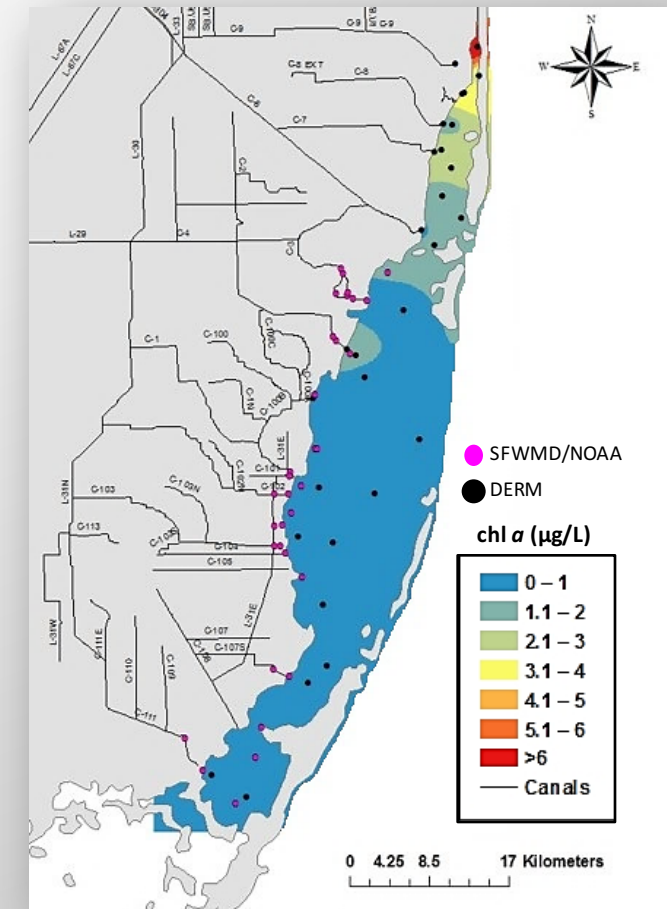
September 2017
(2 weeks after Hurricane Irma)



November 2017
(9 weeks after Hurricane Irma)



January 2018
(18 weeks after Hurricane Irma)



Conclusions

- Freshwater inflows from the mainland, sediments resuspension and decomposition of organic materials resulted in nutrient enrichment of the Bay
- Storm surge & high, post-hurricane freshwater discharges from canals resulted in short-term, sharp salinity & temperature changes near shore
- Algal biomass significantly increased near shore in the weeks following the Hurricane as freshwater inflows subsided and water residency time increased
- Algal biomass in the canals increased in the months following the Hurricane, when freshwater discharges subsided
- Cyanobacteria abundance increased significantly after the Hurricane, but they were outcompeted by diatoms & green algae (in canals) in the following months
- No evidence of a long-term water quality decline or hurricane-induced algal blooms was observed